

Office Action Summary

Application No.

10/780,650

Applicant(s)

BARGATZE ET AL.

Examiner

JaNa Hines

Art Unit

1645

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 55-80 is/are pending in the application.
- 4a) Of the above claim(s) 77-80 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 55-76 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 55-80 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

SUPPLEMENTAL DETAILED ACTION

Amendment Entry

1. The amendment filed November 8, 2007 has been entered. Claims 77-80 are withdrawn from consideration. Claims 55-76 are under consideration in this office action.

Withdrawal of Rejections

2. The rejection of claims 55-76 under 35 U.S.C. 103(a) as being unpatentable over Cutler et al. (US Patent 5,578,309) in view of Jutila et al., (1997. J. Exp. Med. Vol. 186(10):1701-1711 has been withdrawn in view of applicants' amendments to the specification regarding priority.

Priority

3. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

The benefit of the earlier filing date under 35 U.S.C. 120 of the parent applications Serial No. 08/483,558, 08/247,972 and provisional applications 60/007,477 has been denied for claims 55-76 for the instant application. The claims in the instant application recites a feature, i.e. a method for identifying pathogen-ligand adhesive interactions under shear flow conditions, wherein the ligand is immobilized on a substrate. Nor is there support for a method comprising: (a) coating the surface of said substrate with a candidate ligand or target cells expressing a candidate ligand; (b)

moving a fluid across the substrate to create shear flow conditions; (c) introducing pathogens or soluble pathogen adhesins into said moving fluid; and (d) observing adhesive interactions between said pathogens and said coated substrate under shear flow conditions to identify pathogen-ligand adhesive interactions. The instantly recited method was not disclosed or adequately supported by a proper disclosure under 35 U.S.C. 112 in the parent applications. This feature has been first introduced and adequately supported in the 09/068,935 application and thus such claims are entitled only to the filing date of that application; *In re Von Lagenhoven*, 458 F.2d 132, 136, 173 USPQ 426, 429 (CCPA 1972) and *Chromalloy American Corp. v. Alloy Surfaces Co., Inc.*, 339 F. Supp. 859, 874, 173 USPQ 295, 306 (D. Del. 1972).

Therefore, contrary to applicants' assertions, the priority date of May 23, 1994 is denied.

Response to Arguments

4. Applicant's arguments filed May 23, 2007 have been fully considered but they are not persuasive.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 55 is rejected under 35 U.S.C. 102(b) as being anticipated by Cutler et al. (US Patent 5,578,309).

Claim 55 is drawn to a method for identifying pathogen-ligand adhesive interactions under shear flow conditions wherein the ligand is immobilized on a substrate.

Cutler et al., teach studies on adherence properties of *C. albicans*. Cutler et al, teach cells are immobilized on the polystyrene microspheres suspended in buffer and subjected to shear flow conditions (col. 10, lines 5-16). Yeast cells are analyzed to determine whether there is attachment (col. 10, lines 16-19). Example 2 teaches tissue adherence characteristics of *C. albicans* and adhesin isolation; by use of an ex vivo adherence assay, the adherence characteristics of hydrophilic and hydrophobic yeast cells to mouse splenic and lymph node tissue was examined; binding of *C. albicans* yeast cells to mouse popliteal lymph node tissue is mediated by macrophages (col. 10, lines 30-45).

Therefore Cutler et al., teach the instant claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 56-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cutler et al. (US Patent 5,578,309) as applied to claim 55 above, and further in view of Jutila et al., (1997. J. Exp. Med. Vol. 186(10):1701-1711.

The claims are drawn to a method for identifying pathogen-ligand adhesive interactions under shear flow conditions wherein the ligand is immobilized on a substrate. The dependants claims are drawn to specific ligands, flow conditions, and substrate types.

Cutler et al., teach studies on adherence properties of *C. albicans* are important in gaining an understanding of *C. albicans* interactions with its host (col. 3, lines 66-68). The ability to bind to mucus and epithelial surfaces likely plays a critical role in maintaining *C. albicans* at these locations (col. 4, lines 1-3). The fungus also shows adherence specificities for selected populations of splenic and lymph node macrophages Evidence that *C. albicans* binds via a unique adhesion system on phagocytic cells in the marginal zone of the mouse spleen (col. 3, lines 3-10). Some adhesins have integrin-like activity in that they act as receptors for mammalian proteins such as iC3b, fibronectin, laminin and fibrinogen; one adhesin has lectin-like activity (col. 3, lines 33-40). Cutler et al., disclose the identification of the participating ligands and development of inhibitory peptides (col. 3, lines 38-40). Pathogens are the surface of hydrophilic yeast cells of *C. albicans* and have a fibrillar appearance both in vitro and in vivo (col. 3, lines 52-55). Cutler et al., teach the function of moieties on the fungal cell surface and adherence properties, including candidate-host interactions (col. 9, lines 18-24). Example 1 teach a microsphere assay which detects surface

hydrophobic interactions within *C. albicans* populations. The cells are immobilized on the polystyrene microspheres suspended in buffer and subjected to shear flow conditions (col. 10, lines 5-16). Yeast cells are analyzed to determine whether there is attachment (col. 10, lines 16-19). Example 2 teaches tissue adherence characteristics of *C. albicans* and adhesin isolation. By use of an ex vivo adherence assay, the adherence characteristics of hydrophilic and hydrophobic yeast cells to mouse splenic and lymph node tissue was examined; binding of *C. albicans* yeast cells to mouse popliteal lymph node tissue is mediated by macrophages (col. 10, lines 30-45). However Cutler et al., does not specifically recite the specific techniques drawn to the microsphere or adherence assays under shear flow conditions.

Jutila et al., teach cell surface P- and E-selectin support shear-dependant rolling of bovine $\gamma\delta$ T cells. Like Cutler et al., Jutila et al., teach interactions between selectins, a family of adhesion proteins that are required for many interactions. Selectins mediate rolling interactions in both *in vivo* and *in vitro* assays done under flow (page 3917, col.2). Jutila et al., teach a capillary tube shear dependant rolling assay wherein the measurement of the interaction of the leukocytes with cells expression adhesion molecules under controlled shear forces that approximate those that occur *in vivo* is disclosed (page 3918, col.1). Jutila et al., employ capillary tubes as the matrix for the adhesive substrate which was useful in the analysis of shear-dependent neutrophil/endothelial cell interactions (page 3918, col.1). Jutila et al., teach an advantage being that inhibitors can be directly infused into the loop, in addition to pretreatment of the cells before the assay (page 3918, col.1). Jutila et al., teach rolling

interactions can be established first and inhibitors infused later, which avoids potential artifacts associated with pretreatment incubation times and washing steps (page 3918, col.1). Cells were seeded into the tubes; tubing was attached to each end of the capillary tube to form a closed system in which fluid and cells could be recirculated by using a variable speed peristaltic pump containing six rollers to reduce pulsation (page 3919, col.1). Purified bovine cells were injected into the system (page 3919, col.1). Jutila et al., teach reproducible rolling interaction on cytokine-activated endothelial cells and the E-selection cells was detected under flow rates (page 3919, col.1). Jutila et al., teach the effects of various inhibitors such as monoclonal antibodies, neuraminidase and buffer (page 3919, col.2).

Therefore it would have been prima facie obvious at the time of applicants invention to modify the method of Cutler et al., to include the specific steps as taught by Jutila et al., in order to teach rolling interactions can be established first while allowing inhibitors infused later which avoids potential artifacts associated with pretreatment incubation times and washing steps. The art teaches the identification and characterization of pathogen-ligand adhesive interactions, along with a variety of adhesion identification methods including the microsphere, capillary tube and other adherence assays; therefore no more than routine skill would have been required to use shear flow conditions when the art teaches that shear flow determines the interaction. Furthermore, one of ordinary skill in the art would have had a reasonable expectation of success in modifying the method of identification to include shear flow condition using

an immobilized ligand when only routine skill is required to exchange and/or use an alternative ligands and substrates in conjunction with adherence determination.

Conclusion

7. No claims allowed.
8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ja-Na Hines whose telephone number is 571-272-0859. The examiner can normally be reached Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Robert Mondesi, can be reached on 571-272-0956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/JaNa Hines/
Examiner, Art Unit 1645

/Mark Navarro/
Primary Examiner, Art Unit 1645